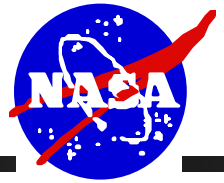
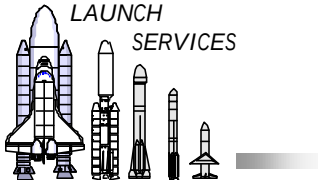




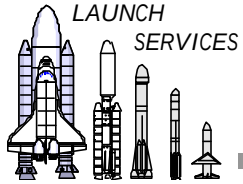
New Frontiers Pre-Solicitation Conference

July 23, 2002

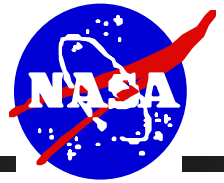
LAUNCH SERVICES

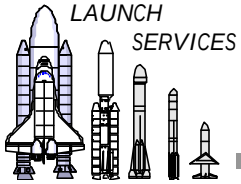
Karen Poniatowski
Assistant Associate Administrator
Launch Services

Launch Services



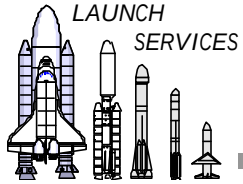
- OVERVIEW OF LAUNCH SERVICES
  - NASA Launch Vehicle Options
  - Key Space Transportation Policies
  - NASA Launch Vehicle Qualification Policy
- NEW FRONTIERS LAUNCH CONSIDERATIONS
  - US ELV
  - Space Shuttle
  - Contributed Launch
  - Special Considerations
- WHAT TO EXPECT IN THE AO
- SUMMARY





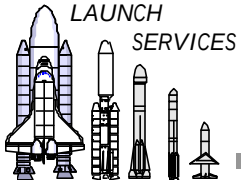
OVERVIEW OF LAUNCH SERVICES

Launch Services Office



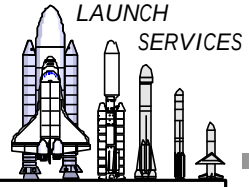
- The OSF Launch Services Office is Responsible for:
  - Identifying and aggregating Agency launch requirements
  - Integrating manifest process for both STS and ELV
  - Enabling access to space on all available launch systems, including the Shuttle, DOD, commercial launch vehicles or foreign vehicles
  - Acquisition and management oversight of the ELV and the Payload Carriers Program
  - Development and Coordination of Shuttle Use and Shuttle Pricing Policy

Launch Services Office



- Launch Services Management Approach:
  - OSF Launch Services Office provides a single interface for Each Enterprise Customer seeking launch services
    - Aggregate Agency launch requirements and assure acquisitions/capability in place to meet agency needs
    - Authorize mission vehicle assignments and resolve issues and manifest conflicts (STS and ELV) through the NASA Flight Planning Board, chaired by OSF
  - ELV and Payload Carriers Program Office assigned responsibility for technical management and acquisition of ELV's for all NASA missions at the Kennedy Space Center (KSC), as well as integration and launch site processing of payloads on the space shuttle
  - Space Shuttle Program assigned responsibility for management and operation of the shuttle, including customer support for primary and secondary payloads

NASA Launch Alternatives



NASA Launch Service Acquisition Strategy

ELV(RLV)

Launch Services Purchases Act

Acquire From U.S. Commercial Source

Available Cost-Effective And Meets Schedule

Launch

Space Shuttle

Launch

Not Available, Or Not Cost-Effective Or Precludes Mission Unique Science Opportunity

Foreign Launch/ International Cooperative

Launch

Economy Act

Launch Service Through Other USG source

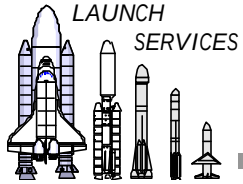
Launch

Presidential Approval

Acquire Foreign Launch Service

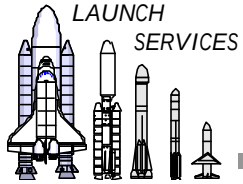
Launch

Launch Vehicle Options



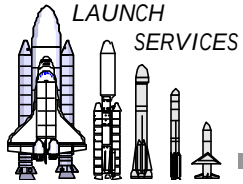
- NASA Acquired Launch Services
  - Pegasus, Taurus
  - Delta II, III, IV
  - Atlas III, IV
- Space Shuttle Mission
  - Dedicated primary payload w/ TBD Upper Stage
  - Secondary payload w/TBD Upper Stage
- Potential Contributed Foreign Launch Vehicles
  - Sealaunch
  - Ariane
  - Proton, Soyuz
  - HII

Requirements Process



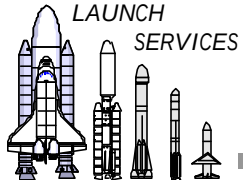
- Enterprise AO
  - Seeks Proposals To Meet Agency Scientific Objectives
  - AO Provides Guidelines For Spacecraft And Launch Vehicle
- The Proposal(s) Selection Based On Scientific Merit
- New Missions Baselined for Flight at The Flight Planning Board(FPB)
- Space Shuttle
  - Shuttle assignment consistent with Shuttle Use Policy Criteria
  - Primary payload assignments require congressional notification
  - JSC identifies launch opportunities, Form 1628 submitted by Enterprise, approved by OSF for Shuttle launch
- ELV
  - ELV assignment baselines ELV performance class
  - Prior to nominal ELV Launch Services ATP, KSC tasked to conduct competitive selection for individual mission from qualified sources consistent with agreed to risk mitigation considerations
  - FPB approves final vehicle assignment, risk mitigation strategy and authorizes KSC to commit to launch service

Key Space Launch Policies



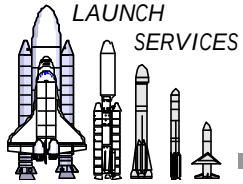
- NSTC PRD 2, 1996 - National Space Policy
- NSTC PDD 4, 1994 - National Space Transportation Policy
  - NSTC PDD 4, par. VI - Use of Foreign Launch Vehicles
- Public Law 105-303 §201-203, 1998 - Launch Services Purchase Act
- Public Law 101-611 §112, 1991 (42 U.S.C. 2465a) - Shuttle Use Policy
- NASA Policy Directives
  - NPD 8610.7 - Launch Services Risk Mitigation Policy for NASA Owned or NASA-sponsored Payloads
  - NPD 8610 - Office of Space Flight (OSF) Space Shuttle Services for NASA and NASA-Sponsored Payloads
  - NPD 8610.23A - Technical Oversight for Expendable Launch Vehicles (ELV) Launch Services
  - NPD 8610.24A - Expendable Launch Vehicle (ELV) Launch Services Readiness Reviews
- All laws/policies applicable to the New Frontier AO and associated launch requirements

Foreign Launch Vehicle Policy



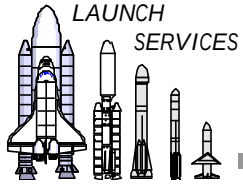
- National Space Transportation Policy Requires All US Government Payloads Be Launched On Vehicles Manufactured In the US.
  - Exceptions:
    - Waived By President, Or His Designee
    - International Cooperative - Launch on No-funds Exchanged Basis with Foreign Partner
  - To date, No Agency has formally pursued an exception to the policy with the Office Of Space Technology Policy

Launch Vehicle Risk Mitigation

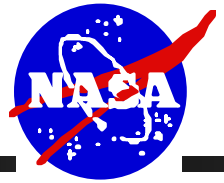


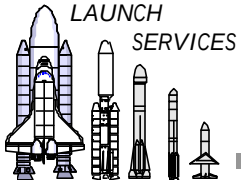
- NASA Policy Directive “Launch Services Risk Mitigation Policy for NASA-Owned or NASA-Sponsored Payloads.”
  - Balances mission risk with launch vehicle demonstrated flight history and maturity.
  - Seeks to ensure that taxpayer-funded spacecraft are not exposed to excessive risk
- The Risk Mitigation Policy identifies three risk categories
  - Risk Category 1: New Launch Vehicles (no prior flight history) - Low Cost, Non-mission Critical Payload
  - Risk Category 2: Launch Vehicle meets minimum one fully successful launch - Moderate complexity, Moderate Cost, Medium Critical Payload
  - Risk Category 3: Launch Vehicle has demonstrated flight history of 95% @ 50% confidence level (14 consecutive successful launches) - Complex, High Cost, Mission Critical Payloads
- New Frontier Missions consistent with Risk Category 3
  - Compliance with risk mitigation approach in work that identifies additional technical penetration to offset lack of demonstrated flight rate at contract award for launch systems derived from heritage systems

Launch Vehicle Heritage & Risk



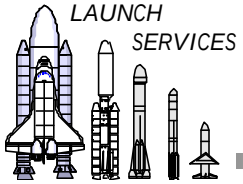
Vehicle	Success Record	Vehicle Qualification Status
Shuttle	109/110	Cat. 3
Delta II	101/103	Cat. 3
Delta III	1/3	Cat. 2/Modified Cat. 3 with 6 flights
Delta IV	TBD	1st Flt. 2002, 6 by 2003, 14 by 2005
Atlas III	1/1	Cat. 2/Modified Cat. 3 with 6 flights
Atlas V	TBD	1st Flt. 2002, 6 by 2005, 14 by 2007





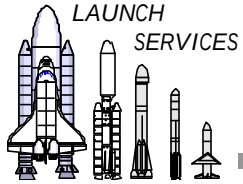
NEW FRONTIERS
LAUNCH CONSIDERATIONS

U.S. ELV Considerations



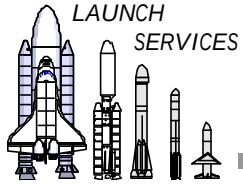
- NASA is required to acquire ELV launch services from U.S. commercial providers per current policy and law
  - Commercial Space Act of 1998
    - Sect. 201, Requirement to procure commercial space transportation services
    - Sect. 202, Acquisition of commercial space transportation services
  - National Space Policy of 1996
    - U.S. Government agencies shall purchase commercially available space goods and services to the fullest extent feasible…
- Commercial launch services for the NASA New Frontiers Program missions are available through the NASA Launch Services (NLS) contract
  - NASA Launch Services Contracts In Place to Acquire:
    - Delta II, III, IV, IVH
    - Atlas III, V
  - Contract includes on-ramps for new services as they are demonstrated

U.S. ELV Considerations (cont)



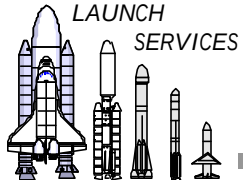
- Risk Management Considerations
  - Delta II:
    - NASA will have capability thru 2008, beyond is TBD
  - Delta III and Atlas III:
    - Each system has one demonstrated successful flight
    - Configurations are planned as transition to new systems
    - Not candidate systems for New Frontier missions
  - Delta IV medium/heavy & Atlas V :
    - Still in Development, first flights targeted for later in 2002
    - NASA will have a technical management approach and risk mitigation strategy in place to enable launch on either system to offset lower projected flight rates (slower achievement of desired demonstrated reliability)
    - Risk of these systems comparable for New Frontiers AO proposals development
- Special Considerations
  - Recommend PI maintain dual-compatibility between Delta IV and Atlas V As as far into development as practical
  - PI should identify/coordinate with KSC planned responsibility for acquisition of upper stage, if required on an ELV

Space Shuttle Considerations



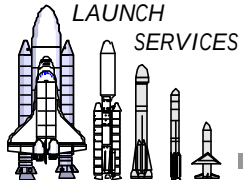
- Space Shuttle Use Policy
  - Current law/policy restricts use of Space Shuttle for Primary Payloads to those that:
    - Require Shuttle Unique Capabilities
    - Require Human Interaction, and/or
    - Other Compelling Circumstances
- NASA HQ currently updating the Space Shuttle use and prioritization process
  - Space Shuttle focused on ISS Assembly thru 2008
  - Limited secondary opportunities with constrained flight rate
  - Agency transition to full cost includes customer funding shuttle integration and potential cost- share for adding shuttle flight
  - Pricing policy under definition
- Other Considerations
  - Potential Unique Payload Carrier Development
  - Space Shuttle Compatible Upper Stage
  - Flight of Nuclear Material

Contributed Launch Services



- Contributed Launch
  - The PI maintains responsibility to find an organization, other than NASA, that will contribute a launch
  - The PI will be required to identify how proposed contributed services meets demonstrated reliability and proposed risk mitigation strategy consistent with intent of NPD 8610.7, Launch Services Risk Mitigation Policy for NASA-Owned or NASA-Sponsored Payloads
  - Compliance with National Space Transportation Policy requires that launch be contributed, no dollars exchanged basis for the launch service

Special Considerations

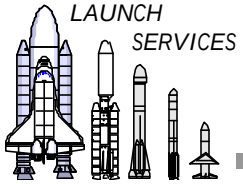


- Presidential Approval Required to Launch U.S. Provided Nuclear Materials on ANY Launch Vehicle, including Foreign Launch Vehicles
  - Nuclear approval effort is complex and time intensive
  - Approvals to date have only been for U.S. launch systems

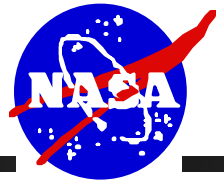
- Presidential Directive/National Security Council – 25 requires quantification of risk associated with launching nuclear spacecraft, creates Safety Analysis Reports (SAR)

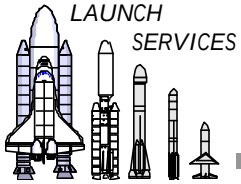
- Comprehensive Launch Vehicle Data Books required to evaluate failure scenarios
  - Atlas V and Delta IV Launch Vehicle Data Books in work
  - Shuttle Launch Vehicle Data Book requires update- JSC assessing effort

Special Considerations (cont.)



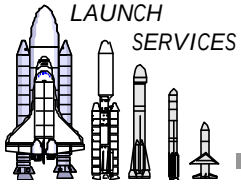
- Shuttle Compatible Upper Stages
  - Lack an investment plan to develop shuttle compatible upper stage
    - Low level MSFC upper stage study currently in work
    - PI will need to identify requirement
  - IUS and TOS upper stages have flown on Shuttle
    - USAF has two IUS vehicles, last launch on Titan IV in 2003
    - Assets for one IUS (-28) could be available for conversion to shuttle use
    - Costs for maintaining IUS capability for one mission prohibitive
- Insight into Foreign Launch Vehicles
  - Little data available beyond Payload Planners Guide (PPG)
  - KSC developing library and database of foreign launch vehicles
    - Limited availability of performance data and CAD drawings
    - In-depth information/modeling will be addressed on a case-by-case basis
  - No agreements in place for ELV Technical Oversight per 8610.23A
- Export Control Regulations & Technology Transfer Concerns (ITAR) will need to be addressed by the PI





WHAT TO EXPECT FOR LAUNCH SERVICES IN THE AO

WHAT TO EXPECT

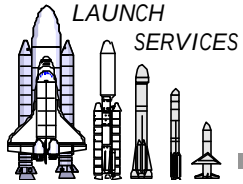


- NASA will provide a Launch Services Information Summary in the AO Library to assist proposers in their launch vehicle trades/selection process

- Assumption for Risk Category 3 Missions is use of NASA-procured launch services, however, the PI can consider/propose other solutions
  - Foreign launch vehicles must be contributed on a no exchange of funds basis and the proposed vehicle must meet the intent of NPD 8610.7
  - The proposal should provide evidence of this commitment from the foreign partner

- For NASA-procured launch services, the launch vehicle is essentially treated as Government furnished service, but still counts toward the total cost cap
  - The Launch Services Information Summary will provide cost estimates for the launch vehicles under contract (Delta IV and Atlas V)
  - Actual ELV service will be determined via a competitive NASA process after mission selection, proposal should reflect compatibility with launch on either system
  - Cost estimates include the standard launch service, typical allocation for mission unique requirements, telemetry support during boost phase, payload processing facility services, and launch vehicle related nuclear approval documentation (if applicable)
  - Costs for use of the Space Shuttle are under discussion

WHAT TO EXPECT (cont.)



- NASA developed web sites are available to assist proposal teams in performing launch vehicle trades
  - ELV vehicle performance: http://elvperf.ksc.nasa.gov
  - ELV vehicle interfaces: http://elvppg.ksc.nasa.gov
  - STS interfaces:

- For more ELV vehicle information, contact KSC ELV Office:

  Darrell Foster, 321-476-3622

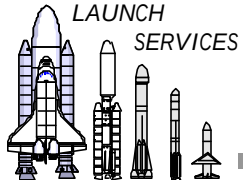
  darrell.foster-1@ksc.nasa.gov

- For STS vehicle information contact:

  J. J. Conwell, 281-483-1178

  jervy.j.conwell1@jsc.nasa.gov

Summary



- STS Launch Opportunities
  - Primary payloads:
    - PI to identify basis for use of shuttle
    - Customer will be responsible for funding Shuttle mission unique (spacecraft processing, optional services, integration) and potentially costs associated with additional dedicated flight
  - Secondary payloads
    - Space available basis, consistent with emerging Agency Priorities and flight rate constraints
    - Customer responsible for funding Shuttle mission unique and potential for cost-share of the flight (based on size/mass of secondary)
  - PI to identify upper stage solution
- ELV Launch Services
  - NASA provided ELV launch services available through NLS
    - Anticipate limited to Delta IV and Atlas V configurations
    - PI demonstrate dual compatibility with both systems
  - PI to identify compliance with Risk Policy for contributed foreign launch services